

What is claimed is:

1. A method for fabricating an image display device comprising an active matrix substrate having a pixel region formed with a large number of pixels arranged as a matrix and a drive circuit region formed with an active circuit for supplying a drive signal to said pixels from outside said pixel region, the method comprising the steps of:

5 forming a polycrystalline silicon film over said pixel region and said drive circuit region of said active matrix substrate;

10 selectively irradiating a portion of the polycrystalline silicon film located in said drive circuit region with a laser beam having a pulse width and/or a pulse interval modulated by scanning the laser beam or the substrate to form discrete reformed regions each composed of a quasi-strip-like-crystal silicon film resulting from reformation, said quasi-strip-like-crystal silicon film having a crystal boundary continuous in the direction of scanning; and

15 forming the active circuit such that a carrier moving direction coincides with a direction of said crystal boundary in each of said discrete reformed regions.

20 2. The method of claim 1, comprising an active matrix substrate having a pixel region formed with a large number of pixels arranged as a matrix and a drive circuit region

formed with an active circuit for supplying a drive signal to said pixels from outside said pixel region, the method comprising the steps of:

5 forming a polycrystalline silicon film over said pixel region and said drive circuit region of said active matrix substrate;

10 selectively irradiating a portion of the polycrystalline silicon film located in said drive circuit region with a laser beam having a pulse width and/or a pulse interval modulated by scanning the laser beam or the substrate to form discrete reformed regions each composed of a quasi-strip-like-crystal silicon film resulting from reformation, said quasi-strip-like-crystal silicon film having a crystal boundary continuous in the direction of scanning; and

15 forming the active circuit such that a carrier moving direction coincides with a direction of said crystal boundary in each of said discrete reformed regions,

20 wherein said step of forming a polycrystalline silicon film comprises the substeps of forming an amorphous silicon film and reforming said amorphous silicon film into a polycrystalline silicon film.

3. The method of claim 2, comprising an active matrix substrate having a pixel region formed with a large number 25 of pixels arranged as a matrix and a drive circuit region

formed with an active circuit for supplying a drive signal to said pixels from outside said pixel region, the method comprising the steps of:

5 forming a polycrystalline silicon film over said pixel region and said drive circuit region of said active matrix substrate;

selectively irradiating a portion of the polycrystalline silicon film located in said drive circuit region with a laser beam having a pulse width and/or a pulse 10 interval modulated by scanning the laser beam or the substrate to form discrete reformed regions each composed of a quasi-strip-like-crystal silicon film resulting from reformation, said quasi-strip-like-crystal silicon film having a crystal boundary continuous in the direction of 15 scanning; and

forming the active circuit such that a carrier moving direction coincides with a direction of said crystal boundary in each of said discrete reformed regions,

wherein said step of forming a polycrystalline 20 silicon film comprises the substeps of forming an amorphous silicon film and irradiating said amorphous silicon film with an excimer laser beam to reform the amorphous silicon film into a polycrystalline silicon film.

4. The method of claim 2, comprising an active matrix 25 substrate having a pixel region formed with a large number

of pixels arranged as a matrix and a drive circuit region formed with an active circuit for supplying a drive signal to said pixels from outside said pixel region, the method comprising the steps of:

- 5 forming a polycrystalline silicon film over said pixel region and said drive circuit region of said active matrix substrate;
- 10 selectively irradiating a portion of the polycrystalline silicon film located in said drive circuit region with a laser beam having a pulse width and/or a pulse interval modulated by scanning the laser beam or the substrate to form discrete reformed regions each composed of a quasi-strip-like-crystal silicon film resulting from reformation, said quasi-strip-like-crystal silicon film having a crystal boundary continuous in the direction of scanning; and
- 15 forming the active circuit such that a carrier moving direction coincides with a direction of said crystal boundary in each of said discrete reformed regions,
- 20 wherein said step of forming a polycrystalline silicon film comprises the substeps of forming an amorphous silicon film and irradiating said amorphous silicon film with a solid-state laser beam to reform the amorphous silicon film into a polycrystalline silicon film.

5. The method of claim 1, wherein the irradiation with  
said laser beam having the pulse width and/or pulse interval  
modulated is performed intermittently at specified  
intervals to form, into a generally rectangular  
5 configuration, each of individual reformed regions  
composing each of said discrete reformed regions.

6. The method of claim 5, wherein the irradiation with  
said laser beam having the pulse width and/or pulse interval  
modulated is performed intermittently along one of the  
10 peripheral sides of the active matrix substrate to arrange  
the individual reformed regions composing each of said  
discrete reformed regions at specified intervals in a  
direction in which said drive circuit region extends.

7. The method of claim 5, wherein the scanning with  
15 said laser beam having the pulse width and/or pulse interval  
modulated is performed reciprocally along one of the  
peripheral sides of the active matrix substrate to arrange  
the individual reformed regions composing each of said  
discrete reformed regions at specified intervals in a  
20 direction in which said drive circuit region extends.

8. The method of claim 5, wherein the scanning with  
said laser beam having the pulse width and/or pulse interval  
modulated is performed along each of opposing two of the  
peripheral sides of the active matrix substrate to arrange  
25 the individual reformed regions composing each of said

discrete reformed regions formed along each of the two sides at specified intervals in a direction in which said drive circuit region disposed along each of the two sides extends.

9. The method of claim 5, wherein the scanning with  
5 said laser beam having the pulse width and/or pulse interval modulated is performed along one of the sides of the active matrix substrate and along a side adjacent to said one side to arrange the individual reformed regions composing each of said discrete reformed regions at specified intervals in  
10 a direction in which said drive circuit region disposed along said one side extends and in a direction in which said drive circuit region disposed along the adjacent side extends.

10. The method of claim 5, wherein the scanning with  
15 said laser beam having the pulse width and/or pulse interval modulated is performed along each of opposing two of the sides of the active matrix substrate and along a side adjacent to each of said two sides to arrange the individual reformed regions composing each of said discrete reformed regions at specified intervals in a direction in which said drive circuit region disposed along each of said two sides extends and in a direction in which said drive circuit disposed along the adjacent side extends.

11. The method of claim 5, wherein said plurality of  
25 discrete reformed regions are divided into blocks and said

blocks are arranged in two or more rows parallel with each other in a direction in which said drive circuit region extends.

12. The method of claim 11, wherein the individual  
5 reformed regions composing each of the discrete reformed regions that have been divided into blocks are arranged in two or more rows parallel with each other in a direction in which said drive circuit region extends.

13. The method of claim 11, wherein said blocks of said  
10 discrete reformed regions are arranged in two or more rows parallel to each other in mutually staggered relation in a direction in which said drive circuit region extends.

14. The method of claim 13, wherein the individual  
reformed regions composing each of the discrete reformed  
15 regions that have been divided into blocks are arranged in two or more rows parallel with each other in mutually staggered relation in a direction in which said drive region extends.

15. The method of claim 1, further comprising the step  
20 of:

forming, by a photolithographic technique, a positioning mark on the amorphous silicon film or the polycrystalline silicon film on said active matrix substrate.

16. The method of claim 1, wherein the positioning mark on said active matrix substrate is formed preliminarily on said active matrix substrate or on an underlie for the amorphous silicon film or the polycrystalline silicon film  
5 on the active matrix substrate.

17. The method of claim 1, further comprising the step of:

10 forming the positioning mark on the amorphous silicon film or the polycrystalline silicon film on said active matrix substrate through irradiation with said laser having the pulse width and/or the pulse interval modulated.

18. The method of claim 1, further comprising the step of:

15 forming a thin-film transistor in said active circuit.

19. The method of claim 1, further comprising at least the steps of:

20 bonding, to said active matrix substrate, a color filter substrate disposed in opposing relation thereto at a specified distance therefrom; and

sealing a liquid crystal in a space between said active matrix substrate and said color filter substrate.

20. The method of claim 1, further comprising at least the steps of:

forming an organic EL layer for each of the pixels composing said pixel region of said active matrix substrate; and

5 bonding a protective substrate to said active matrix substrate such that a surface formed with said organic EL layer of said active matrix substrate is covered therewith.

21. The method of claim 1, wherein said laser beam is a solid-state laser having a wavelength of 200 nm to 1200 nm.

10 22. The method of claim 1, wherein an irradiation width of said laser beam is 20  $\mu\text{m}$  to 1000  $\mu\text{m}$ .

23. The method of claim 1, wherein a scanning speed of said laser beam or a scanning speed of said substrate is 50 mm/s to 3000 mm/s.